U.S. DEPARTMENT OF ENERGY | Legacy Management

Grand Junction, Colorado, Site

FACT SHEET

This fact sheet provides information about the Grand Junction, Colorado, Site.
This site is managed by the U.S. Department of Energy Office of Legacy Management.

Site Description and History

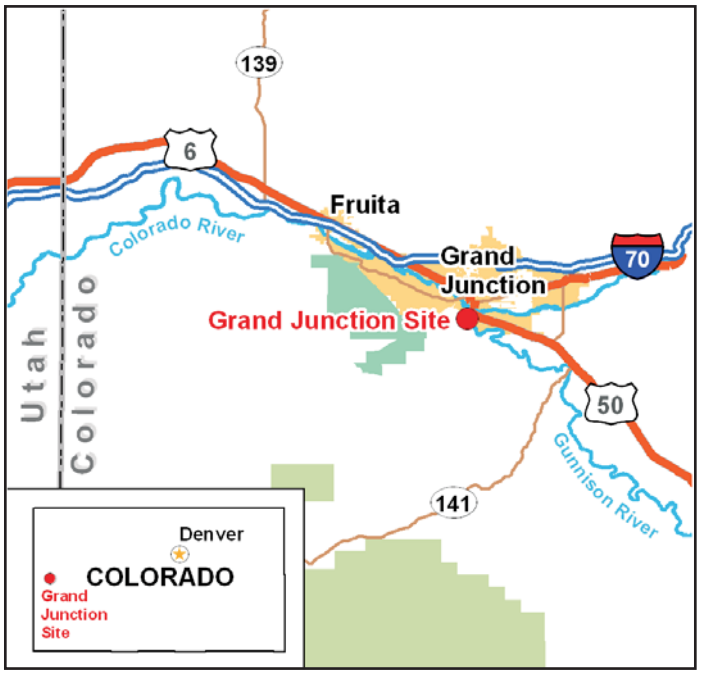
The Grand Junction Site is located in the city of Grand Junction, in west-central Colorado about 25 miles from the Utah border. The Gunnison River flows along the west and north boundaries of the site and flows into the Colorado River about 0.5 mile north of the site.

The U.S. War Department acquired the 54-acre property in 1943 for use by the Manhattan Engineer District, which operated a refinery on site from 1943 to 1946 to concentrate uranium oxide. The refinery produced an estimated 2.36 million pounds of uranium oxide and a comparable amount of vanadium oxide, which were shipped off site for further processing. The U.S. Atomic Energy Commission (AEC), a predecessor agency of the U.S. Department of Energy (DOE), operated a uranium concentrate sampling plant and assay laboratory on site until 1974.

Beginning in 1953, AEC conducted a research program in a small pilot mill at the site to test experimental uranium-ore milling techniques, and in 1954, a larger pilot mill was constructed at the south end of the property. Approximately 30,000 tons of ore were processed before milling operations ceased in 1958.

The milling operations resulted in contamination of soil and groundwater at the site. Surplus uranium ore, uranium mill tailings, contaminated equipment, and other waste from the pilot mills and sampling plant were disposed of on site. Nonhazardous waste materials were buried in a landfill area in the northwest part of the property. Storm water runoff and laboratory waste from an analytical laboratory drained into two on-site ponds. An estimated 100,000 cubic yards of tailings and contaminated soils were stabilized on site, and another 300 cubic yards of contaminated process equipment was buried at the site. Nearly 18 acres of the site was assessed as contaminated.

Contaminants in the stockpiled and buried tailings leached into the shallow alluvial groundwater, which is in direct hydraulic contact with the two on-site ponds, on-site wetlands, and the Gunnison River. Concentrations of molybdenum, nitrate, selenium, and uranium exceeded federal and state standards in the on-site

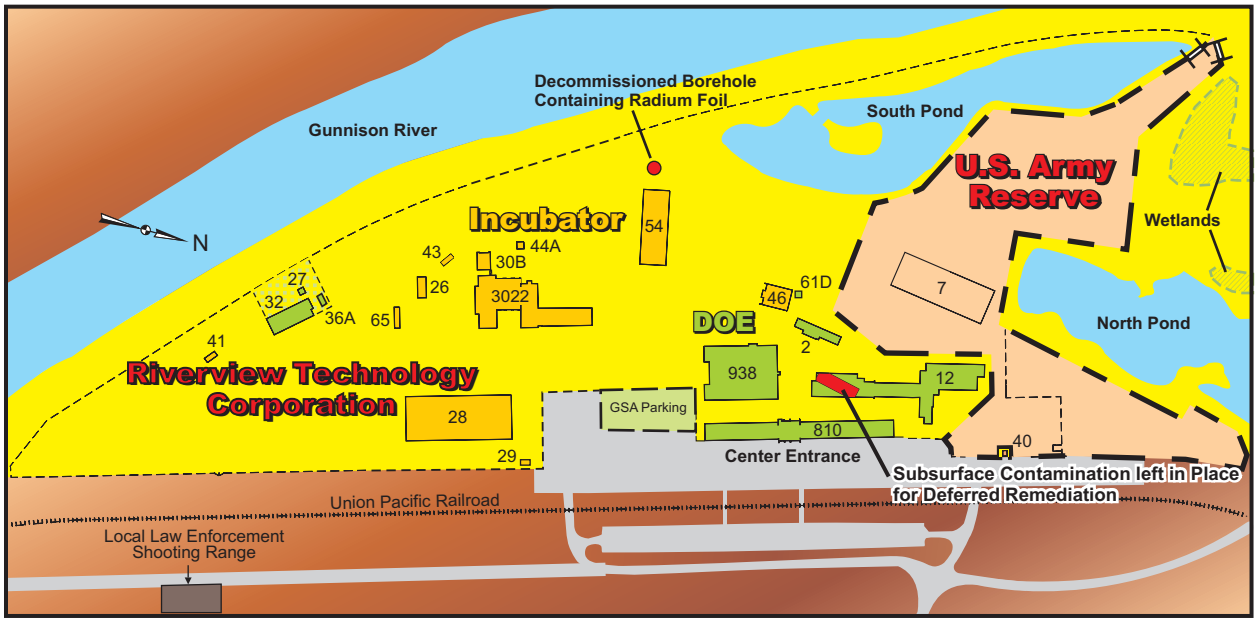


Location of the Grand Junction, Colorado, Site

surface water bodies or in alluvial groundwater beneath the site. Contaminants in groundwater discharging to the river are diluted to levels comparable to levels upstream of the site.

Removal of uranium mill tailings and contaminated soil began in late 1989, and most of the contaminated soil was removed by 1994. Additional small deposits of contaminated soil were removed during remedial action conducted from 1998 through 2001. The total volume of uranium mill tailings and tailings-contaminated material removed from open land areas was approximately 256,340 cubic yards. The tailings and related materials occupied approximately 33.3 acres. The primary locations of remediation included the two on-site pond areas, areas located on the north and northwest of the property, and a dike along the Gunnison River.

DOE also identified 24 buildings at the Grand Junction Site that were radiologically contaminated as a result of past site activities. Remediation consisted of demolishing the buildings or decontaminating them and releasing them for unrestricted use.



Layout of the Grand Junction, Colorado, Site

A concrete slab believed to be the remains of a support structure associated with the original uranium refinery is present beneath Building 12A. Portions of the slab and underlying soil outside the Building 12A footprint were removed and found to contain concentrations of radium-226, thorium-230, and uranium that exceed regulatory limits. However, gamma exposure rates inside the building did not exceed background levels, and the contamination beneath the floor was left in place to allow continued use of the building. In 2000, DOE filed a petition with the governor of Colorado requesting permission to defer remediation of the concrete slab until a later date. The governor approved the request on August 15, 2001. DOE plans to demolish Building 12A and remove the underlying contamination during fiscal year 2010.

In September 2001, DOE transferred about 46 acres of the site to the Riverview Technology Corporation, a nonprofit business development entity sponsored by Mesa County and the City of Grand Junction. Occupants include the Western Colorado Business Development Corporation Small Business Incubator, various small businesses, and DOE's Office of Legacy Management. In December 2001, DOE transferred ownership of the remaining 8 acres on the northwest portion of the property to the U.S. Army Reserve. Company A Detachment 1 of the 244th Engineer Battalion currently occupies the Army Reserve property.

A decommissioned 300-foot-deep, cased borehole containing radium foil remains on site. Two strips of radium-foil were placed around the casing in the borehole and used for calibrating down-hole logging instruments. The borehole was decommissioned in place in 2000. DOE perforated the casing above and below each strip of foil and pressure-grouted the annulus with Portland cement to seal the foil in place. The borehole was filled with grout, and a metal plaque was mounted in concrete at ground level over the well. The plaque describes the level of radioactivity of the radium foil and provides a warning to not disturb the borehole without contacting the Colorado Department of Public Health and Environment (CDPHE). The radium foil is encased at depths of 81 feet (29 picocuries per gram) and 181 feet (3 picocuries per gram) below the surface.

Regulatory Setting

Most of the historical radioactive materials consisted of uranium mill tailings, which are similar to materials regulated either as residual radioactive material under Title 40 *Code of Federal Regulations* Part 192 (40 CFR 192) or regulated as 11(e)(2) by-product material under the Atomic Energy Act of 1954 (Public Law 83-703). Radioactive materials removed from the Grand Junction Site were accepted for co-disposal with Uranium Mill Tailings Radiation Control Act residual radioactive materials at the Grand Junction, Colorado, Disposal Site.

The primary relevant and appropriate regulations for the remediation of the Grand Junction site are 40 CFR 192, “Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings”; and DOE Order 5400.5, *Radiation Protection of the Public and the Environment*. Site groundwater is regulated under Title 5 *Code of Colorado Regulations* Part 1002-41 (5 CCR 1002-41), “The Basic Standards for Ground Water”; and 40 CFR 192. Site surface water is regulated under 5 CCR 1002-35, “Classifications and Numerical Standards for the Gunnison and Lower Dolores River Basins.”

DOE transferred property to the Riverview Technology Corporation pursuant to provisions in the Comprehen-

sive Environmental Response, Compensation, and Liability Act (CERCLA) Section 120 (h), “Property Transferred by Federal Agencies.”

Compliance Strategy

Except for the contamination beneath Building 12A, all soils and buildings at site have been cleaned up and released for unrestricted use. Contamination beneath Building 12A will be removed when the building is demolished. DOE plans to leave the radium foil in the decommissioned borehole in place because it poses no present or future risk to human health or the environment.

The compliance strategy for contaminated groundwater and surface water at the site is natural flushing with institutional controls. Contaminants in the alluvial aquifer are projected to flush to acceptable levels in 50 to 80 years, within the 100-year time frame allowed in 40 CFR 192.

Institutional Controls

Institutional controls applied to the Grand Junction Site consist of access controls and deed restrictions to prevent inadvertent exposure to contaminated media. The deed restriction include prohibitions against disturbance or use of any untreated groundwater underlying the site, including drilling wells, excavating soils that expose groundwater, or diverting groundwater through any means without express written consent of CDPHE and DOE. These restrictions are attached to the property deed and are recorded in the Records of Mesa County. The controls will survive subsequent property transfers. DOE will monitor these institutional controls, and CDPHE will enforce them through CERCLA authorities, as specified in the property sale and transfer agreements.

Legacy Management Activities

DOE's Office of Legacy Management manages the site